

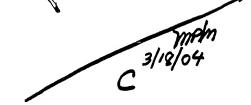
## **CLAIMS**

## What is claimed is:

- 1 1. A method, comprising:
- 2 forming a cladding material over a substrate;
- 3 lithographically patterning and etching the cladding material to obtain core
- 4 regions and a spacing between the core regions that is made of the cladding
- 5 material; and
- filling the core regions with a core material.
- 1 2. The method of claim 1 wherein etching the cladding material comprises using
- 2 an anisotropic etching technique.
- 1 3. The method of claim 1 wherein filling the core regions comprises using a
- 2 deposition technique.
- 1 4. The method of claim 1 wherein filling the core regions comprises using a re-
- 2 flow process.
- 1 5. The method of claim 1, further comprising using a chemical-mechanical
- 2 process to remove excess core material formed over the core regions and over the
- 3 cladding material.
- 1 6. The method of claim 5, further comprising forming another cladding material
- 2 over the core regions and over the spacing.



- 1 7. The method of claim 1 wherein lithographically patterning the cladding
- 2 material includes using a mask.
- 1 8. A method, comprising:
- forming a layer made of a first material over a substrate;
- 3 selectively removing portions of the layer to form regions separated by a
- 4 spacing that is made of the first material; and
- 5 filling the regions with a second material different from the first material.
- 1 9. The method of claim 8 wherein the first material comprises a cladding
- 2 material, wherein the second material comprises a core material, and wherein the
- 3 cladding and core majerials comprise part of an optical waveguide of an integrated
- 4 optical device.
- 1 10. The method of claim 8 further comprising removing excess portions of the
- 2 second material formed over the first material and over the regions.
- 1 11. The method of claim 10 wherein removing the excess portions comprises
- 2 using a chemical-mechanical polishing technique.
- 1 12. The method of claim 8, further comprising forming another layer over the
- 2 regions and over the spacing.
- 1 13. The method of claim 8 wherein filling the regions comprises using a
- 2 deposition or re-flow process to fill the regions with the second material.



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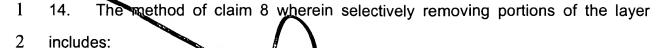
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- lithographically patterning the regions and the spacing, wherein a width of the spacing is reduced relative to a width of the regions; and
- vertically etching the layer based on the lithographic patterning to remove portions of the first material corresponding to the region.
- 1 15. The method of claim 14 wherein lithographically patterning the regions and 2 the spacing includes using a mask.

## 16. A device, comprising:

- a spacing made of a first cladding material and formed by an etch process to remove portions of the first cladding material from core regions adjacent to the spacing;
- a core material filled into the core regions subsequent to removal of portions of the first cladding material from the core regions; and
- a layer made of a second cladding material and formed over the core material and over the first cladding material, including over the spacing.
- $1\,$  17. The device of claim 16 wherein the first and second cladding materials
- 2 comprise a similar material having a lower refraction index than the core material.
- 1 18. The device of claim 16 wherein upper surfaces of the core material, of the
- 2 spacing, and of the first material are substantially flush.

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- 1 19. The device of claim 16 wherein the core regions and spacing are patterned
- 2 using a lithography technique.

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21. The device of claim 16 wherein the core regions are filled with the core

material using a deposition or re-flow technique.

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